A Comprehensive Study of Usability Challenges of an Enterprise Resource Planning (ERP) System: A Study on Beverage Industry, Sri Lanka

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ABSTRACT

Enterprise Resource Planning (ERP) systems have become a critical factor for most of the leading organizations to compete in the business environment. Especially for the large scale multinational organizations, the support from an ERP system is significant to link the process in different divisions and to exercise the control over them. But if the ERP system is not implemented in the appropriate way to match the organization and its needs, the contribution that can be obtained from it will be less. Many researchers have carried out on the factors that affect the successful implementations of ERP systems. But they do not provide the information whether the implemented ERP gives real contribution and support to the organization and to its users. The appropriateness of ERP system and required customization differs from one organization to another as well as one industry to another. Thus it should study on each case separately. Hence there is little number of studies on the usability issues; this research is focusing it relating to the beverage industry in Sri Lanka. Since none of the studies has carried out on beverage industry relating to this aspect of ERP systems this provides new knowledge. The usability issues will not lead to large scale failures but they can interfere with the productivity of the individuals or the work groups. To reduce such issues it should be focused on giving training to the new users while trying to get customize the system and its functions such as help function and error supportive in order to make it more user friendly and organization relevant.

KEYWORDS: Beverage Industry, ERP, Enterprise Resource Planning, Usability Challenges

INTRODUCTION

The trend in today's business industry is to automate and get use more computer based solutions for most of day to day business operations. Most of the leading companies spend on Information Technology (IT) solutions to meet organizational objectives through improving the performance, productivity and the competitiveness in the market. Among the IT solutions, ERP systems are widely used and also have the control over the business operations by integrating the different sections of the organization. This may not lead directly to large scale failures but it can interfere with individual's or workgroup's productivity. Therefore, this research was conducted to identify the presence of common usability challenges in ERP system with their root causes and to find applicable solutions by obtaining the user perceptions of suggested solutions related to the beverage industry in Sri Lanka.

LITERATURE REVIEW

Kumar and Van Hillegersberg (2000) explains ERP systems as configurable information systems (IS) packages that integrate information and Information based processed within and across functional areas in an organization.

It also expresses as a way to integrate the data and processes of an organization into one single system. Usually ERP systems will have many components including hardware and software, in order to

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achieve integration. Most ERP systems use unified database to store data for various functions found throughout the organization.

ERP systems provide a robust and modular framework of business applications with the fundamental purpose of integrating business and supporting managerial decision making (Stefanou, 1999). According to Ehie and Madsen (2005), an ERP system transforms an organization to a more efficient and effective organization.

There are several vital benefits to an organization from the ERP systems such as improving decision making speed, improving control of operations, reducing cost and more importantly improving enterprise-wide information dissemination (Davenport, 1998).

The software packages can be viewed as two types such as in house build systems and off the shelf packages. The current trend shows a move towards the off the shelf packages like SAP, BAAN, Oracle and PeopleSoft. These well known software companies have moved into the direction of wide or cross enterprise integration and developed flexible and multi functional modular packages providing an overall view of the business and multi-dimensional information (Stefanou, 1999).

In the research carried out by Babaian, Lucas & Topi (2004), they have identified number of commonly existing usability issues in such integrated systems. They have categorized these issues into six groups as issues in identification of and access to the correct functionality, transaction execution support problems, system output limitations, and support in error situations, terminology problems and overall system complexity.

Some problems that they found under the category of 'issues in identification of and access to the correct functionality' were the difficulty in understanding and remembering the set of actions that are necessary for completing a specific business process. On the other hand, lack of system support for understanding the business process which mapped to the ERP tasks. Some error messages generating from the system are insufficient to understand the error and correct the error by users (Babaian, Lucas & Topi, 2004). In some cases, some data have to be entered again and again unnecessarily. But these things can be easily automated by customizing the system. Another fact is that the users find it difficult to obtain the desired output specially when generating reports as it is difficult to generate them according to user requirements and they need to download into external applications.

Another common challenge that the users find with an ERP system is to work with the new terminology such as material codes, notifications, document controls, material masters, vendor masters, etc. As a result, all the ERP system gives an overall complex environment for users (Babaian et al, 2004).

These findings have been provided a solid foundation for the researchers to do further investigations on usability issues. One of the significant facts that can be abstracted from these findings is that most of the ERP systems are not properly customized to meet organizational requirements and users are lack in knowledge about the system.

RESEARCH METHODOLOGY

Research design is the science of planning procedures for conducting studies to get the most valid findings. The first step in research design is to identify a research problem. The purpose of this research become as finding the root causes for usability issues of the ERP system relating to the beverage industry in Sri Lanka. Therefore, the research can be classified as an applied research. The most common method of primary data gathering is done through a survey. Questionnaire has been developed focusing research objectives and used to conduct the survey. Focusing the sample group, the questions have been

developed including close ended questions with five point Likert scale as well as open-end questions to add user perceptions of the ERP System. The effectiveness of the questioner was tested by conducting a 'pilot survey'. After the pilot survey, the questionnaire was modified and the survey was conducted.

Descriptive statistics were used for the data analysis and statistical tools were used to illustrate the influence of the certain background factors of the users. For having Usability challenges and the root causes were identified and the alternative solutions were discovered. The best solution was selected to improve the productivity of the ERP users.

DATA ANALYSIS

For the analysis, two departments were selected namely supply chain and Finance. The Executive level employees were selected as none of the non executive employees use the ERP system. In total 37 questionnaires were distributed among 20 users from the Supply Chain and 17 from the Finance Department. From the distributed 37 questionnaires 31 were returned back resulting an 86 percent responding rate.

The collected data were analyzed by using percentages and the mode of the responsive levels with the help of Microsoft Excel package.

Several usability issues could be identified through the literature review as follows.

1. Easy to find the required functions or codes
2. Easy to use the codes for different transactions
3. Can easily find and remembering the set of actions for a transaction
4. Can easily remember the order of screens
5. It is easy to generate reports from system
6. It is easy to understand the contains of the reports
7. Can generate data as per your requirement from reports
8. The error messages are understandable
9. Can correct the error with the help of error message
10. Easy to find and remember the location of entering data
11. Easy to work with the system words (terminology)
12. Can understand the real transaction with the system transaction
13. Easy to work with system
14. Have to enter the same data again and again
15. Need to down load the report to excel or other format

Above listed facts were used for analysis and detailed analysis was done for significant issues which were identified through the analysis. According to the analysis, except last two factors, all of the other facts were presented positively. Hence disagreeing with those statements suggests that users are not that much comfortable with the system in that aspect.

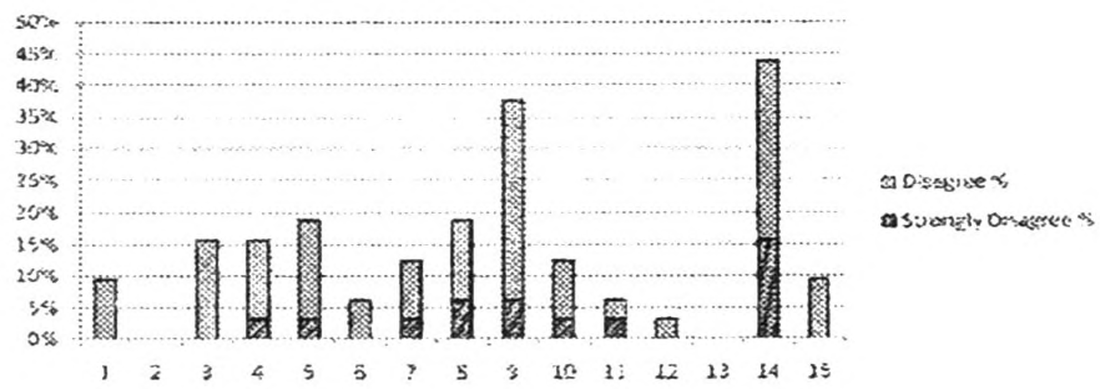

Figure 1: User responses

Significant amount of users find it difficult in correcting the errors as it gives high disagree and strong disagree levels in statements eight and nine. It means that the support from the system in error situation is not sufficient and users are not capable enough of understand the supporting messages given by the system. Even though ERP systems facilitate to generate many reports, practically users find it difficult. According to the analysis, survey results 19 percent disagree level including three percent of strongly disagree level. Further,

users find it difficult to remember the order of screens and the survey results a 16 percent disagree level including three percent strongly disagree with that statement. Further users find it difficult in finding and remembering the set of actions for a transaction by giving a 16 percent disagree percentage in the survey.

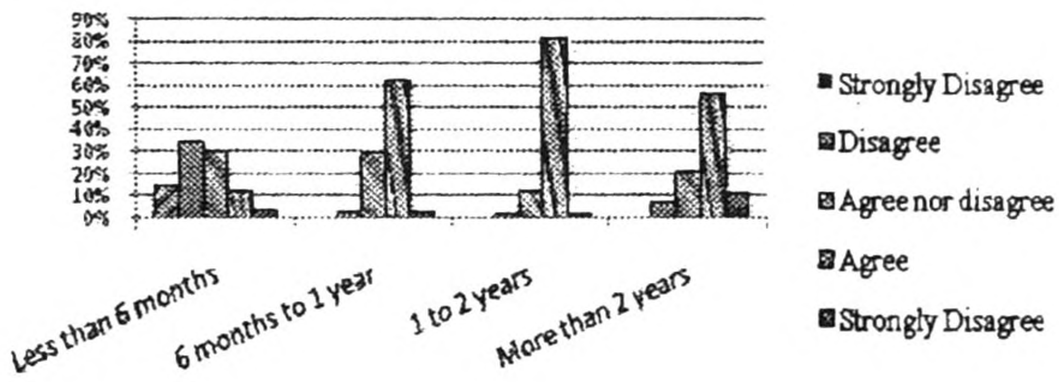

Figure 2: User responses with respect to their experience with the system

From the above graph of responces in each demograph group, it can identify an increased pecentage in strongly disagree and disagree among the users who are having less than six months experience with the system.That shows the users who are less than experienced with the sytem gives more disagree responses since they find difficult with the systm.

Further, user industrial experinces, especially in current possition, were gathered and analysed to identify its' impact on ERP system usage. The analysis has shown below.

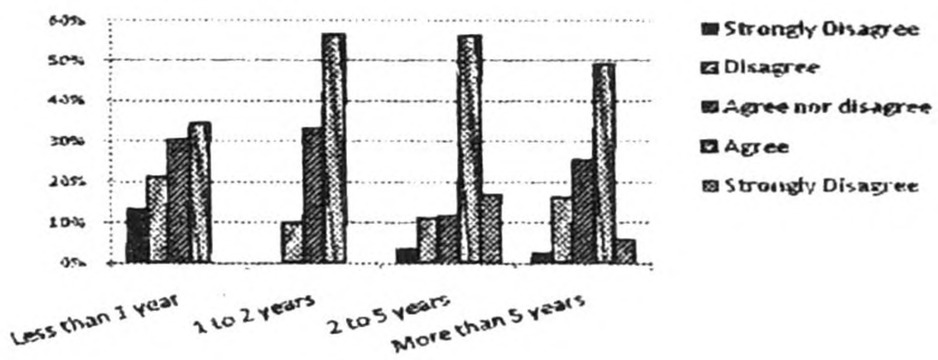

Figure 3: User responses with respect to their experience in the industry

According to the analysis, users who are having less industrial experience on current functions, especially the groups of users who have less than one year of experience seem to find some difficulties in using the system comparable to the other user groups.

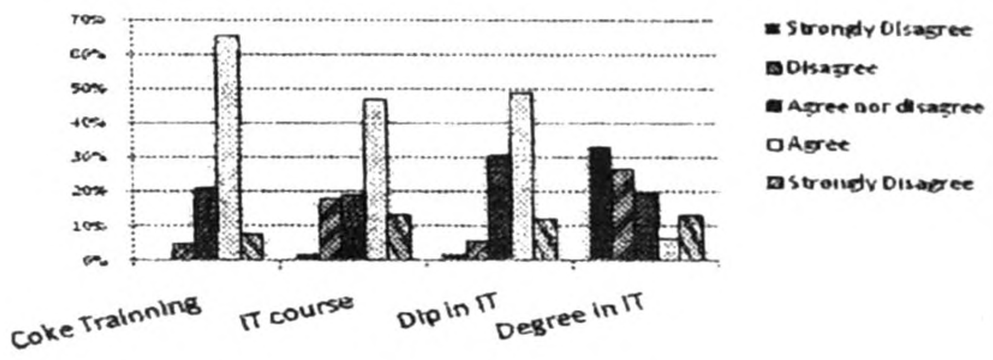

Figure 4: User responses with respect to their IT background

In the above chart it demostates a increased pecentage for strongly disagree and disagree levels among the users who are having a IT degree. But when that users are individually considered all of them are from the less experience group in using SAP. Hence that has cause to have such a graph among that IT degree level users.

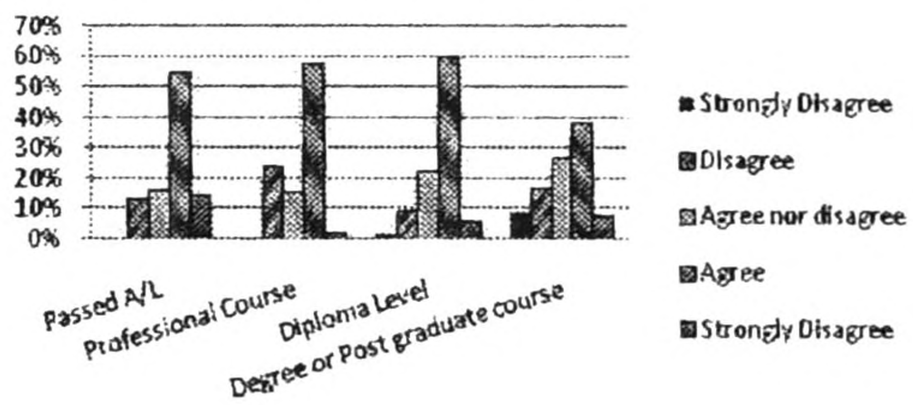

Figure 5: User responses with respect to their educational qualifications

In the above graph, an increase in issues can be identified among the group of users who are having a degree or a post graduate qualification. When further analyzed it was noted that there are some users who are less experience with system.

IDENTIFICATION OF CAUSES AND ALTERNATIVE SOLUTIONS

From the percentages on each response level, it can identify a slight decrease in the percentages of agreeing with the facts understandability of the error messages and neediness to download reports to other applications rather than using directly, as they are almost close to fifty percent. Users disagree with the statement, stating that it can correct the errors with the help of error messages and need to repeatedly enter the same data, resulting a significant drop up to 29 percent and 26 percent respectively.

Since these statements have mentioned in a positive way towards the system, reducing the agreeing level suggests that issues are present.

When the percentages of the all fifteen comments were considered they are below eighty percent except the comment thirteen with 84 percent agree level which says "Easy to work with the system". There can be several causes to have a high percentage of agreeing for that statement. One of such causes is users hesitate to mention the difficulties of doing work with the system or another fact is that they have a good attitude towards the system due to their perceptions even though they face some issues.

Getting low percentages of agreeing states that most of the issues exists to some extent among the users. To analyze this further, it needs to consider the background of the users.

When the responses were analyzed by the experience levels it identifies that there are more "Disagree" responses exist as the mode response of the statements among the experience level "Less than 6 months". This suggests that the users with less experience with SAP face more challenges in using the system. Especially this type of users face the challenges of finding the required functions or codes for the transactions, remembering the set of actions for a transaction, generating the reports, understanding the error messages and correcting with the help of error messages. But when the users get experienced with the system they are able to overcome such challenges since there is decrease in those issues with the experienced SAP users.

When the IT background of the users was considered there can identify a significant decrease in the issues in using the system. Most of these trainings on the ERP system were delivered by the foreign experts on the system focusing exactly on the organization and its functions. This will be the reason for minimizing the issues among the users who receive the training from organization. Another observation is that there is an increase challenges among the "Degree in IT level" but when further analyzed it can see these users are new in using SAP as they belong to "Less than 6 months" category. This suggests that even though users are from a good IT background it needs some time to get familiar with the system.

Any significant relationship to the issues with user educational level or age cannot be identified.

LIST OF ALTERNATIVE SOLUTIONS

From the past research and through the informal discussions with the employees, the following solutions could be suggested to overcome the usability issues.

1. Use less number of screens
2. Customize the screens to display only the relevant items for a transaction
3. Reduce the repeated data entry necessities
4. Use clear meaningful error message
5. Provide more supportive clear help function
6. Have more training on SAP
7. Use industry related meaningful terms in the system
8. Use more excel sheets additional to the system
9. Move to a new system

The suggested improvements were discussed with the employees to get their perceptions. The percentage responses on the suggestions that have mention on the questionnaire are shown in figure 6.

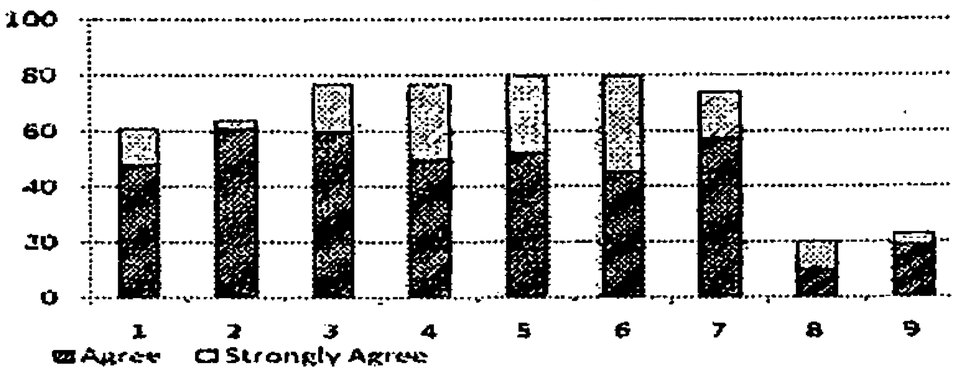

Figure 6: User preference on suggested alternative solutions

The solutions gives can consolidate and state briefly as three alternative solutions as follows.

1. Customize the system
2. Provide more training on ERP System
3. Improve the help functions

When these factors further analyses it was found that the customization and improving help function were appreciated by all the users while 'providing training' was appreciated more from the users who are less experienced with ERP.

RESULTS AND DISCUSSION

Among the above solutions the customizing the system will need a huge effort and funds to remap organization in to the system. But giving more training on ERP system and improving the help function will be more feasible solutions on industry perspective.

Since the new users who are less experience find more challengeable, a proper training should be given to them at the beginning. In such training programs, program should focus more on the significant issues which found through the survey as listed below.

1. Handling the error situations with the help of error messages and help function
2. Generating the reports and understanding the report content
3. The sequence of actions and the relevant screens to follow in processing the transactions

The common issues with the questionnaires such as lack of understandability and poor careless responsiveness may affect the validity of the research data. The implementation and support for the ERP system is given by an external Organization. Thus it was difficult to gather information from the vendor side and only possible to evaluate form customers or users perspective. A research can be done with expanded sample by considering the ERP users in all the plants of Group. This will lead to have an overall idea on usability issues with the ERP system. Further, it can evaluate the different levels of usability issues in different countries. Another aspect of expanding this research relating to Sri Lankan beverage industry is by considering several plants in Sri Lanka. This type of a research will provide a more general view on the contribution from off the shelf ERP systems to the Sri Lankan beverage industry. The trend in the industry is to move into the off the shelf ERP systems. But this may not be the best solution for all the industries. Thus, a research can be carried out to find where off the shelf software packages or the in house built software packages suits more.

Another aspect is the affect of the ERP system to the organizations productivity. This can be done by using the productivity relegated key performance indicators (KPIs) in the organization to evaluate the performance and the productivity before the implementation of SAP and after implementing.

Based on the findings, author suggests providing training on ERP system for users. Therefore a study has to be carried out to find out which type of training more effective such as on the job, off the job, local trainings or trainings from foreign experts (from vender organization), etc. According to the figure 7, it shows that users in the supply chain find more issues as its responses of strongly disagree and disagree are higher compared to Finance. Hence they should be focused when providing training.

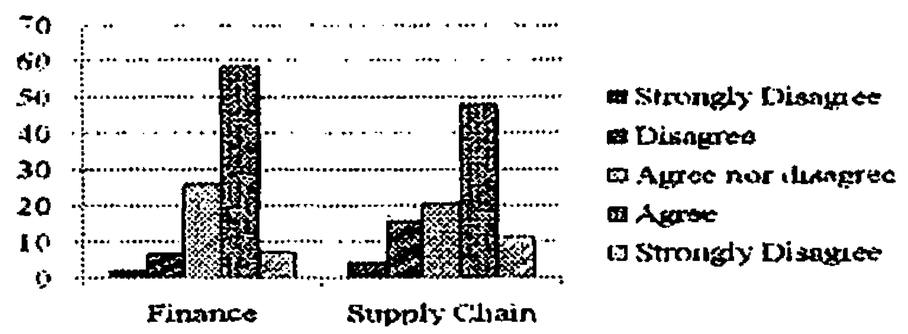

Figure 7: Response levels in respect to department

CONCLUSION

Based on the research study, it can conclude that among the ERP users there are usability issues to some extent. Especially the new users find it difficult to use until they get practiced. From the age group of above 35 years also find some usability challenges. There was no any significant relationship with issues and the educational level or the IT background of the users.

Hence, it is advisable to select more young employees to interact with system by giving them a sufficient training at the begging.

Further, to improve the usability more training should be given to the users, especially for the new users and the users in the supply chain. The system should also be customized to fill the loophole in matching with the real organization. For that it should be focused the improvement of user interfaces, error messages and help function to make users more comfortable with the system. Since changing the system is a costly activity it is worth of conducting a cost benefit analysis before doing it.

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